Canada is, however, running India very close, and the staff of the Ottawa Experimental Farm is actively engaged in studying wheat production, in raising new varieties suited to the different regions, and in devising new methods of management or cultivation likely to increase the yield. It is satisfactory, also, to find that Australia has considerably increased her shipments of wheat and sent more than in any previous year; the yields for some of the States would seem to indicate even further possibilities of increase.

GEORGE MATTHEY, F.R.S.

THE death of Mr. George Matthey, F.R.S., on February 14, in his eighty-eighth year, removes one who whilst actively engaged in commercial work was at the same time keenly interested in scientific progress.

During the early years of his life Mr. Matthey's time was devoted not only to developing and extending the business in Hatton Garden, but also to a most careful study of platinum and its associated metals, and he devised methods by which these metals could be separated quantitatively from each other on a large scale. These methods were described by him in the Proceedings of the Royal Society for 1879 (vol. xxviii., p. 463).

In 1870 an international metric commission met in Paris. Its object was the construction and verification of a new and uniform series of standards, and upon it served such masters of metallurgical and chemical arts as Deville, Debray, and Stas. Certain members of the commission undertook the work of purifying the platinum and iridium of which the new standards were to be composed.

After much labour had been expended, the alloy consisting of platinum with 10 per cent. of iridium was produced, but on analysis it was found to be impure. At this stage Mr. Matthey was invited by the French Minister of War, at the instigation of several important official bodies, to prepare the necessary quantity of alloy. He at once undertook the work of making the large quantities of platinum and iridium in the highest state of purity, and finally cast the ingots of the alloy in Paris. These ingots were submitted to the most rigid analysis, and proved to be exactly of the composition required.

Mr. Matthey was then invited to construct the bars of the somewhat peculiar cross-section which had been already decided upon. The writer well remembers Mr. Matthey telling him that his friends besought him to have nothing to do with the construction of the bars; he was not, however, a man to be daunted by a difficulty of this sort, and he went into the City and bought a second-hand lathe, and set one of his skilled workmen to produce the bars of the desired cross-section. The bars fulfilled all the conditions that were laid down. Copies of them were supplied to all the larger countries of the world, and they now constitute the standards upon which the metric system rests. Mr. Matthey was appointed a member of the Legion of Honour, and in 1879 he was elected a fellow of the Royal Society.

Notwithstanding the absorbing character of business affairs and inroads on his leisure necessitated by his deep interest in scientific progress, Mr. Matthey found time to interest himself in educational matters; he played a very active part in the foundation of the City and Guilds Colleges for the advancement of technical education at Finsbury and South Kensington, and served for many years on the executive governing body of those institutions. His wide knowledge of affairs and his keen judgment of men played no small part in determining the signal success of these two colleges from their very inception. The very complete scheme of technical education with which London is provided is in a large measure due to the enthusiastic efforts of Mr. Matthey in association with two other prominent members of the Goldsmiths Company, Sir Walter S. Prideaux and the late Sir Frederick Abel.

Mr. Matthey for a very prolonged period served as a warden of the Goldsmiths' Company, where his counsel and advice were of the greatest assistance on questions relating to assaying and the precious metals. Almost all who work at scientific research are under a deep debt of gratitude to Mr. Matthey and his firm for unvarying kindness in helping them out of many difficulties by placing the resources of their works so freely at their disposal.

Those who had the privilege of counting Mr. Matthey as a friend realise that they have lost a truly delightful companion, remarkable not only for the wide breadth of his sympathies, but also for his genial temperament and abhorrence of all that savoured of sham.

C. T. H.

NOTES.

MR. DAVID HOOPER, curator of the Industrial Section, Indian Museum, Calcutta, has been appointed economic botanist to the Botanical Survey of India.

THE Rev. A. H. Cooke, author of an important work on molluscs ("Cambridge Natural History Series"), has succeeded Mr. R. Bullen Newton in the presidency of the Malacological Society of London.

THE Toronto correspondent of *The Times* states that the Dominion Government will grant Mr. Stefansson the sum of 15,000*l.* towards his expedition into unexplored territory north of the Canadian mainland. Mr. Stefansson will take with him Canadian students with scientific knowledge, and the expedition will be directly under the Canadian Geological Survey. He expects to be absent three winters and four summers.

DR. W. J. G. LAND, assistant professor of botany at Chicago University, has recently spent four months in investigations in Australia and the Samoan Islands. Two of these months were occupied in the collection and study of plants in the island of Tutuila, where the remarkable growth and variety of the ferns attracted special attention. Dr. Land also made observations in and around the crater of Kilauea in the Hawaiian Islands.

The Geographical Society of Philadelphia has hitherto been accustomed to present its Elisha Kent Kane gold medal to explorers only. This year, however, it has made an innovation by bestowing that honour, the highest in its gift, on a distinguished geologist, Prof. W. M. Davis, of Harvard. The presentation immediately preceded a lecture by Prof. Davis on human response to geographical environment. This was the first of a series of memorial lectures to Angelo Heilprin.

On Tuesday next, February 25, Prof. H. H. Turner will begin a course of three lectures at the Royal Institution on the movements of the stars, and on Thursday, March 6, Mr. W. B. Hardy will deliver the first of two lectures on surface energy. The Friday evening discourse on February 28 will be delivered by the Hon. R. J. Strutt on active nitrogen, and on March 7 by Mr. C. T. R. Wilson on the photography of the paths of particles ejected from atoms.

The Paris correspondent of *The Times* reports that preparations are being made for the dispatch of an official French expedition to Franz Josef Land under M. Jules de Payer, son of the Austrian Captain de Payer, who commanded the Austrian expedition that discovered Franz Josef Land in 1873. The object of the expedition is to explore the little-known north-eastern portion of Franz Josef Land. A base will be established in the archipelago formed by Zichy Land, Liv, Eva, Adelaide, and Hvidtenland Islands. M. de Payer proposes to pass the winter at the base in scientific observations and in preparation for summer work, when a varied programme of scientific investigation will be executed by means of two aëroplanes and a boat fitted with auxiliary power.

A bequest of 100*l.* was left to the Linnean Society by the late Sir Joseph Hooker. The council of the society desires that the bequest should form the nucleus of a fund to be raised for the endowment of a Sir Joseph Hooker lecture, to be delivered every second, third, or fourth year, and to be published by the society. The proposal meets with the warm approval of Lady Hooker. A total sum of not less than 600*l.* should be obtained for this purpose, and the council confidently appeals to the fellows of the Linnean Society and others to contribute. Cheques should be drawn in favour of the "Hooker Lecture Fund," and sent to the general secretary of the Linnean Society, Burlington House, London, W.

The Board of Trade and the principal Atlantic steamship lines are to cooperate in carrying out during the present year the recommendations of the Merchant Shipping Advisory Committee in its report on life-saving at sea as to stationing an ice observation vessel to the north of the steamship routes across the North Atlantic. Following the advice of a conference summoned by the Board of Trade to consider the best means of giving effect to this recommendation, it is proposed this spring to station a vessel off the east coast of North America to the north of the steamship routes to watch the break up of the ice and to report its movement. The *Scotia,* formerly employed on the Scottish Antarctic expedition, has been chartered, and it is anticipated that she will be ready to leave about the end of this month. The vessel is being fitted with a Marconi wireless installation of long range to keep in touch with the wireless stations in Newfoundland and Labrador. The cost of the expedition will be shared between the Government and the principal Atlantic steamship lines. There will be three scientific observers on the vessel, and as she will be from time to time stationary, it is expected they will make oceanographical and meteorological observations of general scientific interest, as well as of direct value to the work in hand.

The Herbert Spencer lecture at Oxford was delivered on February 14 by Prof. D'Arcy Thompson, He began by paying a warm tribute to the memory of Spencer, laying stress on the widespread nature of his influence—an influence that had more effect upon contemporary thought than even that of Kant in a former generation. With no education in literature or art, and without advantages of style, he was yet "a gallant soldier in the cause of intellectual freedom." Passing on to the special subject of his lecture, viz. "Aristotle as a Biologist," Prof. Thompson drew a graphic picture of the natural surroundings of Aristotle during his two years' residence at Mitylene —the period to which, in the opinion of the lecturer, the bulk of his work in natural history is to be attributed. Many reasons of weight were given in favour of the view that in the fauna, and especially the marine fauna, of Lesbos and the neighbouring seas and islands, Aristotle found the chief material for his anatomical researches. This was important in relation to the fact that it limited the date of his chief philosophical works to a time subsequent to the writing of his treatises on biology. Plato "saw as in a vision," but Aristotle was neither artist nor poet, nor, it was to be suspected, a profound mathematician. But he was a naturalist born and bred, and, above all, a student of life itself. His biological instincts and training unmistakably influenced his philosophy. This was apparent alike in his politics, his psychology, and his ethics. In all these his treatment was scientific. Making full use of the comparative method, he yet stopped short of a complete historical conception of evolution.

The widespread belief in the sanctity of the fig-tree, which, as the *pipal* (*Ficus religiosa*), is venerated in India, is illustrated by the account contributed to the January issue of *Man* on the cult of the tree by the A-Kikuyu of East Africa. The exact species of this tree has not been as yet determined, but Mr. W. H. Beech describes it as the medium by which prayers ascend to Ngai, the tribal deity. As is the case with its Indian congeners, the wood is used to make the fire-drill, and the identity of observances connected with the tree seems to suggest a fusion of Indian with East African culture.

We have received from Capt. Stanley Flower a revised list of the zoological gardens and menageries of the world, published apparently at Cairo. The total number is 168.

VOL. iv., No. 2, of *Meddelelser fra Kommissionen for Havundersøgelser, serie: Fisheri,* is devoted to an account by Dr. J. Schmidt of the early ("preleptocephaline") larval stages of congers and certain other eels. It is claimed that this is the first definite identification of some of the earliest stages of the species in question, and therefore the first trustworthy clue to the particular kinds of muraenoids which spawn in the Mediterranean. All the larvæ have pectoral fins, even in cases where these disappear in the adult. They may be divided into two groups, according to the absence or presence of swellings in the intestine, and the even distribution or collection into groups of the pigment cells. To the first group belong *Conger vulgaris, C. mystax,* and *Muraena helena,* and to the second *Nettastoma melanurum,* three species of Ophichthys, and a new form, described as *Leptocephalus telescopicus.* The three species of Ophichthys and the Leptocephalus spawn in winter, instead of, like the rest, in summer.

DR. S. KUSANO has published (Journal of the College of Agriculture, University of Tokyo, iv., No. 3) an account of the life-history and cytology of a new species of Olpidium, which is of great interest with reference to the affinities of the Chytridiales, an extremely lowly group of fungi. The most remarkable feature in the life-cycle of this new form is that some of the swimming reproductive cells (zoospores) regularly copulate in pairs to form a zygote. In discussing the difficult question of the affinities of this remarkable group of organisms, the author inclines to the view that their origin must be sought in the Flagellata or the Mycetozoa rather than in the primitive green algæ; this confirms the conclusion arrived at independently by Němec (see note in NATURE, vol. lxxxix., p. 539).

MISS ANNIE D. BETTS contributes to the current number (December, 1912) of *The Journal of Economic Biology* an extremely interesting account of the fungi of the beehive, having by her investigations added considerably to the knowledge of this subject. The results are based on work done on the combs of stocks which died during the years 1910 to 1912 of the Isle of Wight bee disease. Twelve fungi are described, of which two are apparently confined to beehives, others adapted to hive-life but not confined to this habitat, while others again are commonly or occasionally present but not specially adapted to life in the hive. Some of the fungi belonging to the last category (Penicillium, Aspergillus, and other "moulds") are ubiquitous, but in other cases the fungus spores must be carried from hive to hive by the bees themselves. None of the fungi described appear to be pathogenic, though the presence of much mould in a stock is, if not a cause, at any rate a sign of unhealthy conditions, indicating either that the hive is not weather-proof or that the colony is weak.

THE mysterious sounds known under the general name of brontides, but locally as barisâl guns, mistpoeffeurs, &c., have for some months past been very noticeable in the south-west of Haiti. In this island the sound is called the *gouffre.* According to Mr. J. Scherer (Bull. of the Seis. Soc. of America, vol. ii., pp. 230–232), it is most frequently heard in the range of La Selle. On its northern side, this range is bounded by a steep cliff, formed by displacements along a fault that is believed to be still growing. The sounds appear to come from the base of this cliff, and, as they are the same as those which accompany noticeable earthquakes (the Haitians apply the name of *gouffre* to both), it is suggested that they are caused by small adjustments of the crust along the fault. The *gouffre* is also heard in the north-western part of the island, at Port-de-Paix and Limonade.

IN view of the approaching return of the drift-ice season, the meteorological chart of the North Atlantic for February, issued by the Deutsche Seewarte, contains an interesting summary of the prevalence of ice in that ocean during 1912. The Meteorological Office charts also contain much useful information on the same subject, with table showing the extreme limits of icebergs and field ice in 1901–12, and diagram of phenomenal drifts during a long series of years. Last year the drift was one of the most remarkable ever known; little ice was sighted prior to the middle of February, but by the end of March a general and rapid spread was observed. By the end of May the drift reached about 38½° N., and in June its southern limit had extended almost to 37° N. The positions laid down on the charts refer to the general drift; isolated bergs were met with much further south. In fact, the Meteorological Office diagram shows that ice may be observed almost anywhere in mid-ocean north of 30° N. With reference to the rate at which icebergs may travel, the Seewarte quotes an interesting case. On April 29, in 41° 25′ N., 41° 43′ W., the ss. *Clio* passed a berg supposed to be that with which the *Titanic* collided on April 14, and which therefore had travelled 380 nautical miles, E.¼S., in fifteen days. One end of the berg was broken off, probably owing to impact with a vessel, and the water round about it was strewn with wreckage, such as chairs. towels, and other articles.

IN the *Revue générale des Sciences* for January 15 Mr. R. de Baillehache, one of the members of the French Commission on Units, directs attention to the advantages of the metre-kilogramme-second system for practical as well as scientific purposes. In view of the legislation on the subject foreshadowed by the French Minister of Commerce and Industry in August last, he draws up a scheme of definitions and suggests several new names for the units which up to the present have not had special names assigned to them. For the unit of capacity the litre is retained and the cubic metre becomes the kilolitre. The unit of force—the cop (Copernicus)—communicates an acceleration of one metre per second to a mass of one kilogramme. The unit of pressure—the tor (Torricelli)—is one cop per square metre, and is equal to ten baries. The unit of heat is the kilogramme degree of water at 15° C. The electrical units are the present ohm, volt, and ampere.

THE December, 1912, number of *Terrestrial Magnetism* contains an account, by Dr. G. E. Hale, of the attempts which have been made at Mount Wilson Solar Observatory to detect the Zeeman effect due to the magnetic field at the sun's surface. An objective of 1 ft. diameter and 60 ft. focal length forms an image of the sun on the slit of the 75-ft. spectrograph, which to prevent temperature disturbances is mounted in a vertical shaft in the ground. Photographs of the region near the sodium lines in the third order spectrum were taken, and a neat polarising arrangement allowed either the red or the violet edge of a broadened line to be photographed. The plates on measurement showed evidence of a positive displacement of the lines in the northern and a negative in the southern hemisphere of the sun, the magnitudes reaching their maxima at about 50° north or south latitude. Further observations are being made with the view of fixing the magnitudes of the displacements more accurately.

WITH reference to Mr. R. M. Deeley's letter on retinal shadows in NATURE of January 30, we have received other letters bearing upon the point. Mr. H. H. Bemrose thinks, probably correctly, that they are the same as Purkinje's figures. Mr. C. Welborne Piper once saw similar branching lines after experimenting with powerful sources of light. In his case they were coloured red against a background of an approximately complementary colour, whilst with the other eye green vessels were seen against a red background. Purkinje's figures are most easily seen with lateral illumination of the dark-adapted eye. Shadows of the retinal vessels are then thrown upon the sentient layer of the retina, the rods and cones. Mr. Piper's observation is of considerable interest. Black print has frequently been seen to look red when viewed in bright illumination. This is undoubtedly due to coloration of the light by blood during transmission through the lateral wall of the eyeball. Birkhoff, however, has shown that erythropsia or red vision may occur after gazing at a brightly illuminated surface for ten to fifteen minutes when all lateral light is excluded. Rivers holds that erythropsia in general is due to blood, the conditions under which it is observed being such as more or less to eliminate the normal red adaptation of the retina. The transient appearances noticed by our correspondents may be regarded as Purkinje's figures seen in unfavourable circumstances owing to the general diffusion of the illumination.

THE February issue of *The Chemical World* contains a reprint of a hitherto unpublished letter from Sir Humphry Davy to Prof. W. T. Brande, who in 1813 succeeded him as professor of chemistry in the Royal Institution. Written from Idria, it contains a description of a visit to a quicksilver mine containing veins of cinnabar up to a foot in thickness. Davy also records the occurrence, in the great salt mine at Halstadt, of a blue variety of salt; as this blue colour is now attributed to the action of radium emanation, it is not surprising to read the statement: "I have been again searching in vain for the cause of this extraordinary colour." Both mines, occurring in bituminous schist, contained dangerous quantities of inflammable air, and gave to Davy the opportunity of introducing his safety lamp. The letter, with two others, is now in the possession of Sir William Tilden.

SOME interesting views as to osmosis in soils are developed by Dr. C. J. Lynde and Mr. F. W. Bates in two papers published in *The Journal of Physical Chemistry* (vol. xvi., pp. 758–781). Experiments are brought forward to show that a clay soil acts as a semi-permeable membrane, and that by virtue of the osmotic pressure of the solutions of salts in the soil transference of water can be effected. The efficiency of a soil column as a semi-permeable membrane increases with its depth, comparatively long columns being necessary to produce the same effects as a perfect semi-permeable membrance. The view that an osmotic movement of water occurs in soils would explain an increased supply of water brought through the subsoil to the surface in the summer months, when the plants actually need more water, and the beneficial results of soil mulching and certain practices in dry farming.

THE January issue of the Journal of the Chemical Society contains an important paper by Mr. T. R. Merton on the photography of absorption spectra. A method has been adopted which resembles those recently devised by Dr. Houstoun, of Glasgow, the chief feature of which is that the actual "extinction-coefficients" are measured instead of merely the thickness of solution required to blot out a particular spectrum line in a photograph. By using this method it has been found possible to determine the actual form of the extinction-curves, and in particular the shape of the single absorption band in the visible spectrum of cobalt nitrate (Proc. Chem. Soc., January 23, 1913). It appears that the curve showing the width of spectrum absorbed is of a simple mathematical form, its distribution about the central axis of the band being identical with that of the well-known probability curve. The axis of the band is, however, not vertical, *i.e.* the wave-length of maximum absorption changes slightly with the concentration of the solution. It is suggested that the anomalous form of many extinction-curves is due to the superposition of several curves of the above simple form.

RED Book No. 177 of the British Fire Prevention Committee contains a report on a system of extinguishing petrol fires which has given very satisfactory results. The system comprises either a permanent installation, wheeled fire appliances, or small extinguishers, as the case may be, from which certain chemicals are forced, the extinguishing effect being obtained by the combination of two liquids which produce a thick foam which gradually spreads over the surface of the burning petrol, thereby excluding air and extinguishing the fire. According to the report, two petrol fires of considerable area and severity were creditably dealt with, as well as numerous smaller fires, and the extinguishers were also effective on celluloid fires. The system is one which claims the attention of those concerned in the ever-increasing hazards of petrol, used particularly for transport purposes. Copies of the report may be obtained from the assistant secretary, British Fire Prevention Committee, 8 Waterloo Place, S.W.

WE have received a copy of an address delivered by Prof. C. Neuberg before the members of the German Zentralstelle für Balneologie, at Schwerin, in September last, entitled "Beziehungen des Lebens zum Licht" (Berlin, Allgemeine Medizinische Verlagsanstalt, pp. 63, price 1.50 marks). This address contains a valuable summary of recent work on the influence of light on living organisms, both from the chemical and biological aspects; in this field Prof. Neuberg has himself been an active worker, and some of the views he develops, regarding the influence of sunlight on health and disease, will be read with considerable interest.

AN illustrated article in *Engineering* for February 14 gives an account of the large Humphrey gas pumps installed at Chingford. There are five sets in all; the first two were started on January 18 and 19, and the third a week ago; the remaining sets will no doubt be at work before the official opening of the Chingford Reservoir by his Majesty the King on March 15 next. No accurate tests have been made as yet, but it is already sufficiently obvious that the guaranteed output is being very substantially exceeded. So carefully have the designs of the pumps been worked out that the only detail altered, as the result of seeing them at work, has been the substitution on certain valve-spindles of a solid nut instead of the split one originally provided. It has required considerable courage to accept a contract, under very stringent penalties, for pumps of this type, 7 ft. in diameter, and developing each between 200 and 300 h.p., on the basis of the experience gained of an experimental pump having an output equivalent to about 35 h.p only. The results so far have entirely justified Mr. Humphrey's confidence in the capabilities of his remarkable contribution to the progress of mechanical engineering.

OUR ASTRONOMICAL COLUMN.

VARIATION OF LATITUDE: THE KIMURA TERM.—After applying all known corrections to the results obtained by the International Latitude Service, there remains a periodic term, known as the Kimura term, for which many explanations have been suggested. Dr. F. E. Ross now suggests that this term is not real, but is due to our lack of knowledge concerning the method of treating the results. He points out that any one of the suggested explanations is efficient, but argues that there is no need for them, for any periodic error in the system of mean declinations adopted would produce a so-called Kimura term. (*Astronomische Nachrichten,* No. 4630.)

WESTPHAL'S COMET.—Having investigated, by Pontécoulant's method, the perturbations of Westphal's comet (1852iv) for the period 1852–1914, Herr M. Viljev publishes a set of elements and a number of search-ephemerides in No. 4621 of the *Astronomische Nachrichten.* As the time of perihelion passage is still uncertain, he gives a number of ephemerides, extending to March 12, which cover the period ±240 days on either side of the computed epoch; the period of the comet is 61·5554 years, and it last passed perihelion on October 12, 1852.

THE OPACITY OF THE ATMOSPHERE IN 1912.—An article in No. 63 of the *Gazette astronomique* directs attention to the general opacity presented by the sky on cloudless nights during the late spring, the summer, and the autumn of 1912. M. de Roy found sixth-magnitude stars invisible to the naked eye, even on moonless nights and at the zenith, while other observers in many parts of the world found a lack of transparency, noticeable in observations of the sun and stars and in the unusual paleness of the blue of the sky. A suggested explanation of the phenomenon is that volcanic eruptions, more especially the one which took place in the Alaskan peninsula and Aleutian archipelago in June, polluted the atmosphere with fine dust, and so reduced its transparency.

A ZOOLOGICAL GARDEN FOR EDINBURGH.

THE council of the Zoological Society of Scotland, in pursuance of its project of raising the necessary funds for the purchase and laying out of the estate of Corstorphine Hill House as a zoological garden and park, as announced in NATURE of January 30, has issued a prospectus giving a brief account of the development of the modern zoological garden of the type the society wishes to establish, together with some suggestions regarding the benefits of such an institution to education, science, and art, and a full description of the site selected for the purpose. The prospectus is illustrated with scenes depicting enclosures and ranges in the New York Zoological Park and in Carl Hagenbeck's menagerie at Stellingen, which, with modifications, will serve as models for the kind of accommodation it is proposed to adopt for the animals in Edinburgh. Finally, there are many beautiful views of the grounds of the abovementioned estate, which not only testify to the wisdom of the council in its choice of a situation, but suggest that, given the necessary funds for the purchase of stock and the upkeep of the collection, Scotland will be able to claim that it has at least the most picturesque zoological garden in Europe.

The scheme for the establishment of the garden was in some danger, at the time of our recent note on the subject, owing to the approaching expiry of the society's option for the purchase of this fine site, and the doubt whether a sufficiently large amount would be subscribed within the brief period remaining. This danger has been averted by the action of the Edinburgh Town Council, which has agreed to purchase the site, of which the society will have the entire use and control in return for an annual payment of 4 per cent. on the price, the society having the right to redeem the site from the corporation within fifteen years. The society is already assured, by gift and loan, of a large and representative collection of animals, and it is the intention of the council to have a number of them installed and the garden open to the public by the beginning of July, 1913, though operations involving much disturbance of the ground will be deferred until the winter months. Funds are urgently needed, both for the future development of the garden and for the redemption of the site, and donations should be intimated to the honorary treasurer, Mr. T. B. Whitson, C.A., 21 Rutland Street, Edinburgh.